

ABSTRACT

A full form net shape roll finished contacting machine element such as a gear or sprocket is produced from a near net shape workpiece of wrought or forged steel including teeth with an initial outer peripheral contoured surface, each having a tooth flank with a nominally involute surface and a root/fillet region with a trochoidal surface. A rolling die is rotatably supported on a first axis. With the workpiece rotatably supported on a parallel distant second axis, the rolling die is advanced in an in-feed direction to meshingly engage with the workpiece. The involute surface of each tooth of the rolling die engages the involute surface of a mating tooth of the workpiece and the tooth tip of the rolling die engaging the trochoidal root/fillet surface between adjacent mating teeth of the workpiece to effect material flow along the outer peripheral contoured surface. This process continues for all of the teeth of the workpiece.